

## Pile Driving

A marine-oriented structural engineering firm, TERA, Inc., Houston, Texas, is engaged in a project to evaluate the reliability of offshore pile driving prediction methods, a step toward an eventual capability for predicting the best pile driving technique for each new offshore oil platform. TERA is conducting the evaluation in behalf of seven offshore oil rig operators: Chevron Corporation, Conoco, Inc., Marathon Oil Company, McDermott International, Inc., Mobil Oil Research and Development Corporation, Pennzoil Company and Shell Oil Company. The upper right photo shows an offshore pile driving operation; at lower right is a working offshore platform.

In Phase I of the project, TERA digitized the pile driving records of 48 offshore platforms, including such information as blow counts, soil composition and pertinent construction details. In Phase II, the pile driving records were statistically compared with current methods of prediction. The result of the work was development of modular software that participating companies can use to evaluate other prediction procedures or other data bases.

TERA, Inc. was aided in its software development by the software package CRISP80, Software Design Analyzer System. Originally developed for Jet Propulsion Laboratory, CRISP80 was supplied to TERA by NASA's Computer Software Management and Information Center (COSMIC), which makes available to industrial clients government-developed computer programs that have secondary applicability (see page 122). Dr. E.A. Verner, principal of the project, reports that CRISP80 was very valuable in construction of TERA's Pile Driving Predictability Program and a real bargain: "A similar program would have cost around \$15,000. At \$400, CRISP80 was a good buy."

For the first five years, TERA's Pile Driving Predictability Program will be distributed only to project sponsors. The software will help determine an unknown in wave equation methods: soil resistance and behavior as a stress wave travels down the pile. The data base contains information on more pile driving influences than can be accounted for by present theories; eventually, TERA hopes to expand the program to account for more of these influences. ▲

